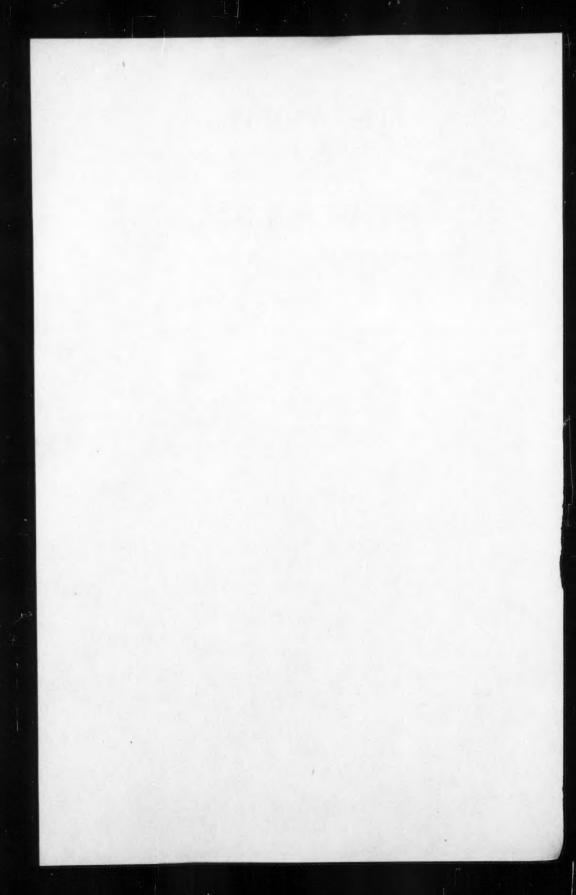
THE ANNALS of

STATISTICS

An Official Journal of the Institute of Mathematical Statistics

VOLUME 2



CONTENTS OF VOLUME 2 ARTICLES AND SHORT COMMUNICATIONS

ADENSTEDT, ROLF K. On large-sample estimation for the mean of a sta-	1005 1107
tionary random sequence	1095-1107 396-402
ANTILLE, ANDRÉ. A linearized version of the Hodges-Lehmann estima-	
tion	1308-1313
ANTONIAK, CHARLES E. Mixtures of Dirichlet processes with applica-	
tions to Bayesian nonparametric problems	1152-1174
BANERJEE, K. S. and WORTHLEY, REGINALD. A general approach to	
confounding plans in mixed factorial experiments when the number of	570 505
levels of a factor is any positive integer	579-585
BERAN, RUDOLF. Asymptotically efficient adaptive rank estimates in lo-	62.74
cation models BERK, KENNETH N. Consistent autoregressive spectral estimates	63-74 489-502
BERRY, DONALD A., HEATH, DAVID C. and SUDDERTH, WILLIAM D.	489-502
Red-and-black with unknown win probability	602-608
BHATTACHARYA, P. K. Convergence of sample paths of normalized	002-008
sums of induced order statistics	1034-1039
BICKEL, P. J. Edgeworth expansions in nonparametric statistics	1-20
BINGHAM, CHRISTOPHER. An antipodally symmetric distribution on the	1 20
sphere	1201-1225
BLUMENTHAL, SAUL. Admissibility of translation invariant tolerance in-	
tervals in the location parameter case	694-702
BLYTH, COLIN R. Necessary and sufficient conditions for inequalities of	
Cramér-Rao type	464-473
BRADLEY, RALPH A., GOVINDARAJULU, Z. and WEED, HARRISON, D.,	
JR. Stopping times of some one-sample sequential rank tests	1314-1322
BRESLOW, N. and CROWLEY, J. A large sample study of the life table	
and product limit estimates under random censorship	437-453
BREWSTER, J. F. Alternative estimators for the scale parameter of the	
exponential distribution with unknown location	553-557
BREWSTER, J. F. and ZIDEK, J. V. Improving on equivalent estimators	21-38
BROWN, L. C. and COHEN, ARTHUR. Point and confidence estimation of	0.00
a common mean and recovery of interblock information	963-976
Brown, Lawrence D. and Fox, Martin. Admissibility of procedures	240 266
in two-dimensional location parameter problems	248-266
Brown, Lawrence D. and Fox, Martin. Admissibility in statistical	907 914
problems involving a location or scale parameter	807-814
tion of several multiple regressions	558-561
COGBURN, ROBERT and DAVIS, HERBERT T. Periodic splines and spec-	220-201

tral estimation	1108-1126
COHEN, ARTHUR and BROWN, L. D. Point and confidence estimation of a common mean and recovery of interblock information	963-976
COHEN, ARTHUR and SACKROWITZ, HAROLD B. On estimating the com-	
mon mean of two normal distributions	1274-1282
COPAS, J. B. On symmetric compound decision rules for dichotomies CRAIN, BRADFORD R. Estimation of distributions using orthogonal ex-	199-204 454-463
pansions	
and product limit estimates under random censorship	437-453
DARST, R. B. Remarks on measurable selections	845-847
DAS GUPTA, SOMESH. Probability inequalities and errors in classification DAVIS, HERBERT T. and COGBURN, ROBERT. Periodic splines and spec-	751-762
tral estimation	1108-1126
DE HAAN, LAURENS. On sample quantiles from a regularly varying distribution function	815-818
DOKSUM, KJELL. Empirical probability plots and statistical inference for	
nonlinear models in the two-sample case ECCLESTON, J. A. and HEDAYAT, A. On the theory of connected designs:	267-277
Characterization and optimality EATON, MORRIS. A probability inequality for linear combinations of	1238-1255
bounded random variables	609-614
EATON, MORRIS L. and PERLMAN, MICHAEL D. A monotonicity property of the power functions of some invariant tests for MANOVA	1022-1027
ENIS, PETER and GEISSER, SEYMOUR. Optimal predictive linear discriminants	403-410
ESARY, JAMES D. and MARSHALL, ALBERT W. Multivariate distributions	
with exponential minimums	84-98
angular boundary	170-176
FEARS, THOMAS R. and MEHRA, K. L. Weak convergence of a two-sample empirical process and a Chernoff-Savage theorem for ϕ -mixing	
sequences FEDERER, W. T., HEDAYAT, A. and RAKTOE, B. L. On a measure of ali-	586-596
asing due to fitting an incomplete model	650-660
sifications	1000-1021
measures	615-629
FLYNN, JAMES. Averaging vs. discounting in dynamic programming: A counterexample	411-413
Fox, MARTIN and BROWN, LAWRENCE D. Admissibility of procedures	
in two-dimensional location parameter problems Fox, Martin and Brown, Lawrence D. Admissibility in statistical	248-266
problems involving a location or scale parameter	807-814

CONTENTS OF VOLUME 2

FRANCIS, IVOR and CHATTERJEE, SAMPRIT. Classification and estima-	550 561
tion of several multiple regressions	558-561
	102 110
inants	403-410
GHOSH, MALAY and SEN, PRANAB KUMAR. Sequential rank tests for lo-	E40 EE2
GODAMBE, V. P. and THOMPSON, M. E. Estimating equations in the	540-552
	540 571
presence of a nuisance parameter	568-571
GORDON, LOUIS. Completely separating groups in subsampling	572-578
GORDON, LOUIS. Efficiency in subsampling	739-750
GOVINDARAJULU, Z., BRADLEY, RALPH A. and WEED, HARRISON D.,	1214 1222
JR. Stopping times of some one-sample sequential rank tests	1314-1322
GREEN, RICHARD F. A note on outlier-prone families of distributions	1293-1295
GRENANDER, ULF. Large sample discrimination between two Gaussian	247 252
processes with different spectra	347-352
GUPTA, B. C. and TRACY. D. S. Generalized h-statistics and other sym-	027 044
metric functions	837-844
GUTTMAN, IRWIN and TAN, W. Y. Inconsistencies in the Villegas	202 204
method of determining a prior distribution	383-386
HABERMAN, SHELBY J. Log-linear models for frequency tables derived	011 024
by indirect observation: Maximum likelihood equations	911-924
HAJEK, JAROSLAV. Asymptotic sufficiency of the vector ranks in the	75 02
Bahadur sense	75-83
HAJEK, JAROSLAV and KIMELDORF, GEORGE. Regression designs in au-	520 527
toregressive stochastic processes	520-527
HALPERN, ELKAN F. Posterior consistency for coefficient estimation and model selection in the general linear hypothesis	703-712
	/03-/12
HAMADA, NOBORU. On a geometrical method of construction of group	1351-1356
divisible incomplete block designs	803-806
HANSEN, OLE HAVARD and TORGERSEN, ERIK N. Comparison of linear	803-806
	2/7 272
normal experiments HARTLEY, MICHAEL J., PAGANO, MARCELLO and REVANKAR, NAGESH	367-373
S. A characterization of the Pareto distribution	599-601
HASEGAWA, MINORU and PERLMAN, MICHAEL D. On the existence of a	399-001
minimal sufficient subfield	1049-1055
HEATH, DAVID C., BERRY, DONALD A. and SUDDERTH, WILLIAM D.	1049-1055
Red-and-black with unknown win probability	602-608
HEDAYAT, Y. and ECCLESTON, J. A. On the theory of connected designs:	002-008
Characterization and antimality	1238-1255
Characterization and optimality	1230-1233
	148-158
signs	146-138
asing due to fitting an incomplete model	650-660
HETTMANSPERGER, THOMAS P. and KLIMKO, LAWRENCE A. A note on	030-000
HETIMANSPERGER, THOMAS P. and KLIMKO, LAWRENCE A. A note on	

the strong convergence of distributions	597-598
HIPP, CHRISTIAN. Sufficient statistics and exponential families	1283-1292
HOLLANDER, MYLES, PLEDGER, GORDON and LIN, PI-ERH. Robust-	
ness of the Wilcoxon test to a certain dependency between samples	177-181
HUBER, PETER J. FISHER information and spline interpolation	1029-1033
JENSEN, D. R. On the joint distribution of Friedman's χ_r^2 statistics	311-322
JOHN, P. W. M. and HEDAYAT, A. Resistant and susceptible BIB de-	
signs	148-158
JOHNSON, B. R. and TRUAX, D. R. Asymptotic behavior of Bayes tests	
and Bayes risk	278-294
JOHNSON, RICHARD A. Asymptotic results for inference procedures	
based on the r smallest observations	1138-1151
KAGEYAMA, SANPEI. On the reduction of associate classes for the PBIB	
design of a certain generalized type	1346-1350
KAILATH, THOMAS and WEINERT, HOWARD L. Stochastic interpreta-	
tions and recursive algorithms for spline functions	787-794
KALLENBERG, OLAV. A note on the asymptotic equivalence of sampling	
with and without replacement	819-821
KARLIN, SAMUEL. Inequalities for symmetric sampling plans I	1065-1094
KELLEY, THOMAS A. A note on the Bernoulli two-armed bandit problem	1056-1062
KHATRI, C. G. and SHAH, B. K. Proof of conjectures about the expected	1030-1002
values of the elementary symmetric functions of a noncentral Wishart	
matrix	833-836
KHATRI, C. G. and SRIVASTAVA, M. C. Asymptotic expansions of the	633-630
nonnull distributions of likelihood ratio criteria for covariance ma-	
trices	109-117
KIEFER, J. General equivalence theory for optimum designs (approxi-	109-117
mate theory)	849-879
KIMELDORF, BENJAMIN. Estimating the kernels of nonlinear orthogonal	049-019
polynomial functionals	353-358
KIMELDORF, GEORGE and HAJEK, JAROSLAV. Regression designs in au-	333-336
	520-527
toregressive stochastic processes	320-327
KLIMKO, LAWRENCE A. and HETTMANSPERGER, THOMAS P. A note on	507 500
the strong convergence of distributions	597-598
KOHLBERG, ELON. Repeated games with absorbing states	724-738
KOHLBERG, ELON and ZAMIR, SHMUEL. Repeated games of incomplete	1040 1041
information: The symmetric case	1040-1041
KUSHNER, HAROLD J. Stochastic approximation algorithms for con-	712 722
strained optimization problems	713-723
LAI, TZE LEUNG. Control charts based on weighted sums	134-147
LANDERS, D. Minimal sufficient statistics for families of product meas-	1225 1222
ures.	1335-1339
LANKE, JAN and RAMAKRISHNAN, M. K. Hyperadmissibility in survey	***
sampling	205-215

CONTENTS OF VOLUME 2	* 4.4
LAURENT, ANDRÉ G. The intersection of random spheres and the non-	
central radial error distribution for spherical models LE CAM, LUCIEN. On the information contained in additional observa-	182–189
tions	630-649
LE CAM, L. and LEHMAN, E. L. J. NEYMAN-On the occasion of his	
80th birthday No	. 3., vii-xi
LEHMANN, E. L. and LE CAM, L. J. NEYMAN. On the occasion of his	
80th birthday No	o. 3, vii-xi
LEMBERSKY, MARK R. On maximal rewards and ε-optimal policies in	
continuous time Markov decision chains	159-169
LIN, PI-ERH, HOLLANDER, MYLES and PLEDGER, GORDON. Robustness	
of the Wilcoxon test to a certain dependency between samples	177-181
LING, KANG. On two-move prediction games	988-999
MACNEILL, IAN B. Tests for change of parameter at unknown times and	
distributions of some related functionals on Brownian motion	950-962
MACRAE, ELIZABETH CHASE. Matrix derivatives with an application to	
an adaptive linear decision problem	337-346
MAKOWSKI, GARY. A rate of convergence of a distribution connected	
with integral regression function estimation	829-832
MALTZ, CARL. Estimation of the kth derivative of a distribution func-	250 261
tion	359-361
MARSHALL, ALBERT W. and ESARY, JAMES D. Multivariate distributions	04.00
with exponential minimums	84-98
MARSHALL, ALBERT W. and OLKIN, INGRAM. Majorization in multivari-	1189-1200
ate distributions	1109-1200
sample empirical process and a Chernoff-Savage theorem for ϕ -mix-	
ing sequences	586-596
MILLER, RUPERT G., JR. An unbalanced jackknife	880-891
MOORE, MARC. Bayesian reconstructions of m,n-patterns	1226-1237
NORDBROCK, EARL. A rational decision criterion, the iterated minimax	1220-1237
regret criterion	775-786
OLKIN, INGRAM and MARSHALL, ALBERT W. Majorization in multivari-	775-700
ate distributions	1189-1200
ORKIN, MICHAEL. On stationary policies—The general case	219-222
PAGANO, MARCELLO. Estimation of models of autoregressive signal plus	-17
white noise	99-108
PAGANO, MARCELLO, HARTLEY, MICHAEL J. and REVANAKER, NAGESH	- 1
S. A characterization of the Pareto distribution	599-601
PAIK, U. B. and FEDERER, W. T. Analysis of nonorthogonal n-way clas-	
sifications	1000-1021
PÁZMAN, A. A convergence theorem in the theory of D-optimum exper-	
imental designs	216-218
PERLMAN, MICHAEL D. and EATON, MORRIS L. A monotonicity prop-	

erty of the power functions of some invariant tests for MANOVA	1022-1227
PERLMAN, MICHAEL D. and HASEGAWA, MINORU. On the existence of a minimal sufficient subfield	1049-1055
verse linear regression problem	535-539
PIRIE, WALTER R. Comparing rank tests for ordered alternatives in ran- domized blocks	374-382
PLEDGER, GORDON, HOLLANDER, MYLES and LIN, PI-ERH. Robustness of the Wilcoxon test to a certain dependency between samples	177-181
PORT, SIDNEY C. and STONE, CHARLES J. Fisher information and the	
Pitman estimator of a location parameter	225-247
gression lines are parallel	295-310
RAFTER, J. A. and SEIDEN, E. Contributions to the theory and construc-	
tion of balanced arrays	1256-1273
RAKTOE, B. L., FEDERER, W. T. and HEDAYAT, A. On a measure of ali-	650-660
asing due to fitting an incomplete model	030-000
sampling	205-215
tion	1296-1301
RAY, ROSE M. Maxmin $C(\alpha)$ tests against two-sided alternatives	1175-1188
REVANKAR, NAGESH S., HARTLEY, MICHAEL J. and PAGANO, MAR-	
CELLO. A characterization of the Pareto distribution	599-601
RHENIUS, DETLEF. Incomplete information in Markovian decision	
models	1327-1334
RIZVI, M. HASEEB and SAXENA, K. M. LAL. On interval estimation and	1340-1345
simultaneous selection of ordered location or scale parameters Robbins, H. and Siegmund, D. The expected sample size of some tests	1340-1343
of power one	415-436
ROBERTSON, TIM and WRIGHT, F. T. A norm reducing property for iso-	
tonized Cauchy mean value functions	1302-1307
ROBERTSON, TIM and WRIGHT, F. T. On the maximum likelihood esti-	
mation of stochastically ordered random variates	528-534
RUIZ, FELIPE and SEIDEN, ESTHER. On construction of some families of	502 510
generalized Youden designs	503-519
RUYMGAART, F. H. Asymptotic normality of nonparametric tests for independence	892-910
SACKROWITZ, HAROLD B. and COHEN, ARTHUR. On estimating the	092-910
common mean of two normal distributions	1274-1282
SACKROWITZ, H. and STRAWDERMAN, W. On the admissibility of the	
M.L.E. for ordered binomial parameters	822-828
SAXENA, K. M. LAL. On interval estimation and simultaneous selection	
of ordered location or scale parameters	1340-1345

CONTENTS OF VOLUME 2

ix

118 - 133

SCHLOZ, FRIEDRICH-WILHELM. A comparison of efficient location estimators 1323-1326 SEIDEN, E. and RAFTER, J. A. Contributions to the theory and construc-1256-1273 tion of balanced arrays SEIDEN, ESTHER and RUIZ, FELIPE. On construction of some families of generalized Youden designs 503-519 SEN, PRANAB KUMAR. Almost sure behaviour of U-statistics and von Mises' differentiable statistical functions 387-395 SEN, PRANAB KUMAR. The invariance principle for one-sample rankorder statistics 49-62 SEN, PRANAB KUMAR and GHOSH, MALAY. Sequential rank tests for lo-540-552 SERFLING, R. J. Probability inequalities for the sum sampling without replacement 39-48 SHAH, B. K. and KHATRI, C. G. Proof of conjectures about the expected values of the elementary symmetric functions of a noncentral Wishart 833-836 matrix SHAPIRO, C. P. Bayesian classification: Asymptotic results 763-774 SHORACK, GALEN R. Random means 661-675 SIEGMUND, D. and ROBBINS, H. The expected sample size of some tests of power one 415-436 SOBEL, MILTON and UPPULURI, V. R. R. Sparse and crowded cells and Dirichlet distributions 977-987 SRIVASTAVA, M. C. and KHATRI, C. G. Asymptotic expansions of the nonnull distributions of likelihood ratio criteria for covariance ma-109-117 trices STIGLER, STEPHEN, M. Linear functions of order statistics with smooth weight functions 676-693 STONE, CHARLES J. Asymptotic properties of estimators of a location parameter 1127-1137 STONE, CHARLES J. and PORT, SIDNEY C. Fisher information and the Pitman estimator of a location parameter 225-247 STONE, M. Large deviations of empirical probability measures 362-366 STRAND, OTTO NEALL. Coefficient errors caused by using the wrong covariance matrix in the general model 935-949 STRAWDERMAN, WILLIAM E. Minimax estimation of powers of the variance of a normal population under squared error loss 190-198 STRAWDERMAN, W. and SACKROWITZ, H. On the admissibility of the M.L.E. for ordered binomial parameters 822-828 SUDDERTH, WILLIAM D., BERRY, DONALD A., and HEATH, DAVID C. Red-and-black with unknown win probability 602-608 SUSARLA, V. Rate of convergence in the sequence-compound squareddistance loss estimation problem for a family of m-variate normal dis-

tributions

TAN, W. Y. and GUTTMAN, IRWIN. Inconsistencies in the Villegas	
method of determining a prior distribution	383-386
THOMPSON, M. E. and GODAMBE, V. P. Estimating equations in the	
presence of a nuisance parameter	568-571
TONG, YUNG LIANG and PERNG, S. K. A sequential solution to the in-	
verse linear regression problem	535-539
TORGERSEN, ERIK N. and HANSEN, OLE HAVARD. Comparison of lin-	
ear normal experiments	367-373
TRACY, D. S. and GUPTA, B. C. Generalized h-statistics and other sym-	
metric functions	837-844
TRUAX, D. R. and JOHNSON, B. R. Asymptotic behavior of Bayes tests	
and Bayes risk	278-294
UOSAKI, KATSUJI. Some generalizations of dynamic stochastic approxi-	
mation processes	1042-1048
UPPULURI, V. R. R. and Sobel, Milton. Sparse and crowded cells and	
Dirichlet distributions	977-987
WAHBA, GRACE. Regression design for some equivalence classes of ker-	
nels	925-934
WEED, HARRISON D., JR., BRADLEY, RALPH A. and GOVINDARAJULU,	
Z. Stopping times of some one-sample sequential rank tests	1314-1322
WEINERT, HOWARD L. and KAILATH, THOMAS. Stochastic interpreta-	
tions and recursive algorithms for spline functions	787-794
WEISS, LIONEL. The asymptotic sufficiency of a relatively small number	
of order statistics in tests of fit	795-802
WOODROOFE, MICHAEL. Maximum likelihood estimation of translation	
parameter of truncated distribution II	474-488
WORTHLEY, REGINALD and BANERJEE, K. S. A general approach to con-	
founding plans in mixed factorial experiments when the number of	
levels of a factor is any positive integer	579-585
WRIGHT, F. T. and ROBERTSON, TIM. A norm reducing property for iso-	The state of the s
tonized Cauchy mean value functions	1302-1307
WRIGHT, F. T. and ROBERTSON, TIM. On the maximum likelihood esti-	
mation of stochastically ordered random variates	528-534
YAKOWITZ, S. Multiple hypothesis testing by finite memory algorithms	323-336
YOHAI, VICTOR J. Robust estimation in the linear model	562-567
ZAMIR, SHMUEL and KOHLBERG, ELON. Repeated games of incomplete information: The symmetric case	1040-1041
ZIDEK, J. V. and BREWSTER, J. F. Improving on equivariant estima-	
tors	21-38
NOTES	
FABIAN, VACLAV. Acknowledgment of priority to "Note on Anderson's	10/2
sequential procedures with triangular boundary"	1063

CONTENTS OF VOLUME 2 xi GERALD. Correction to "An elementary theorem on the probability of large deviations" 1357 HUBER, PETER J. and STRASSEN, VOLKER. Correction to "Minimax tests and the Nevman-Pearson lemma for capacities"..... 223-224 KILLEEN, TIMOTHY J., HETTMANSPERGER, THOMAS P. and SIEVERS, GERALD. Correction to "An elementary theorem on the probability of 1357 MARSAGLIA, GEORGE. Acknowledgment of priority to "Random variables with independent binary digits" 848 PFANZAGL, J. Corrections to "Asymptotic expansions related to minimum contrast estimators" 1357-1358 SEN, PRANAB KUMAR. Correction to "The invariance principle for onesample rank-order statistics" 1358 SEIVERS, GERALD, HETTMANSPERGER, THOMAS P. and KILLEEN, TIM-OTHY J. Correction to "An elementary theorem on the probability of large deviations" 1357 STRASSEN, VOLKER and HUBER, PETER J. Correction to "Minimax tests

and the Neyman-Pearson lemma for capacities"

223-224